REMARKS/ARGUMENTS

Claims 1-20 are pending in the application.

Claims 1, 4, and 16 are hereby amended.

1. Claims 1-20 were rejected under 35 USC 102(e) as anticipated by Abrol. Abrol describes only an "enhanced radio link protocol (RLP)". In the RLP, radio link protocol frames are transmitted over wireless channels. The "frames" are a formatting construct specifically for radio communications. These frames are merely formats for transmissions over the radio link. Thus, the RLP enhancements described by Abrol regard the air interface and loss of frames over the air interface.

Applicant's claims, on the other hand, specify global sequence numbers for particular data that is communicated from server to client. The global sequence numbers are actually included in data packets of the data of a payload (whatever that payload may be, per the particular network protocols of the server). The payload referred to in Applicant's claims is not the "frame" transmitted over the air interface, as per the RLP. Rather, the payload is the particular data communicated according to the network protocols, such as TCP, UDP, etc. (e.g., Application, p. 7, lines 7-11; p. 7, line 20 – p. 8, line 10 "each payload... is formatted in respective data packets...").

These differences between Abrol and Applicant's claims are particularly pointed out, for example, in Applicant's amended independent claims 1 and 16 by reference to the global sequence number being included in at least one data packet of the payload. Abrol does not address aspects of data packets of the data payload (as the terms are used by Applicant); rather,

Abrol describes only the assignment of a sequence number to frames transmitted by the radio link over the air interface.

The distinction is apparent in view of the OSI model. Abrol operates in the physical layer/data link layer to solely assure/ascertain desired air communications of frames. Applicant's claims, on the other hand, are directed to error correction/rectification at the higher network protocol layers of the network-communicated data payload, itself (E.g., Please refer to the attached pages that provide further explanation of the Radio Link Protocol (RLP) at the air interface, versus the higher network format/protocol layers, such as TCP/UDP, of the network data payload).

2. Claims 1 and 16 were rejected under 35 USC 102(e) as anticipated by Edmon. Edmon, similarly to Abrol, regards protocol changes/enhancements at a different OSI model layer. The examiner stated that the "destination address of payload in Edmon can be read as the global sequence number." However, the destination address in Edmon is apparently the MAC or IP address according to the particular network, for the destination device intended to receive a communication. Such destination address is not the particular data payload, itself, referenced in Applicant's claims.

Rather, Applicant's claims particularly identify that the data payload is "information... organized in payloads" for communication to the client and that the payload corresponds to "different elements or data types... or other information that is separately arranged in files or payloads for delivery" (e.g., Application, p. 7 line 20 – p. 8, line 1). Moreover, the global sequence number of Applicant's claims is an identifier for this type of data payload and is included in the data packet comprising the data payload. In short, Applicant's claims regard the

data being communicated via network communications, not any particular destination addressing or the like that is handled instead by the applicable network protocols (e.g., IP).

3. Claim 18 was rejected under 35 USC 102(e) as anticipated by Birdwell. Birdwell more accurately describes the concept of compressing a data packet by compressing the particular packet header for the data packet. Birdwell does not contemplate compression together of separate packet headers (i.e., each corresponding to respective data packets of an entire payload). Applicant's claim particularly describes "compressing together all headers" of a payload. This compressing together of headers corresponding to different respective data packets is not disclosed by Birdwell.

Applicant respectfully requests withdrawal of the rejections and allowance of all pending claims.

If the Examiner has any questions or comments, the undersigned attorney for Applicant respectfully requests a call to discuss any issues. The Office is authorized to charge any excess fees or to credit any overage to the undersigned's Deposit Account No. 50-1350.

Respectfully submitted,

Date: December 12, 2005

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Radio Link Protocol

From Wikipedia, the free encyclopedia that anyone can edit.

Radio Link Protocol (RLP) is a semi-reliable automatic repeat request (ARQ) protocol used over the air interface. Main purpose is to increase link reliability by means of retransmissions in the expense of additional delays. RLP only retransmits some specified amount of time, and declares the frame as lost if all retransmissions fail. It expects higher layers (such as TCP) to take responsibility of error correction.

Cellular networks such as GSM and CDMA use different variations of RLP.

External links

- Data Service Options for Wideband Spread Spectrum Systems: Radio Link Protocol (http://externe.inrs-emt.uquebec.ca/users/mike/sem_lit/is707-2.htm)

OSI model

From Wikipedia, the free encyclopedia that anyone can edit.

The **Open Systems Interconnection Reference Model** (**OSI Model** or **OSI Reference Model** for short) is a layered abstract description for communications and computer network protocol design, developed as part of the Open Systems Interconnect initiative. It is also called the **OSI seven layers model.**

Contents

- 1 Purpose
- 2 Description of layers
  - 2.1 Layer 1: Physical layer
  - 2.2 Layer 2: Data link layer
  - 2.3 Layer 3: Network layer
  - 2.4 Layer 4: Transport layer
  - 2.5 Layer 5: Session layer
  - 2.6 Layer 6: Presentation layer
  - 2.7 Layer 7: Application layer
- 3 Interfaces
- 4 Table of examples
- 5 Parallel
- 6 Humor
- 7 See also

Purpose

The OSI model divides the functions of a protocol into a series of layers. Each layer has the property that it only uses the **functions of the layer below**, and only exports functionality to the layer above. A system that implements protocol behavior consisting of a series of these layers is known as a 'protocol stack' or 'stack'. Protocol stacks can be implemented either in hardware or software, or a mixture of both. Typically, only the lower layers are implemented in hardware, with the higher layers being implemented in software.

This OSI model is roughly adhered to in the computing and networking industry. Its main feature is in the interface between layers which dictates the specifications on how one layer interacts with another. This means that a layer written by one manufacturer can operate with a layer from another (assuming that the specification is interpreted correctly.) These specifications are typically known as Request for Comments or "RFC"s in the TCP/IP community. They are ISO standards in the OSI community.

Usually, the implementation of a protocol is layered in a similar way to the protocol design, with the possible exception of a 'fast path' where the most common transaction allowed by the system may be implemented as a single component encompassing aspects of several layers.

This logical separation of layers makes reasoning about the behavior of protocol stacks much easier, allowing the design of elaborate but highly reliable protocol stacks. Each layer performs services for the next higher layer, and makes requests of the next lower layer. As previously stated, an implementation of several OSI layers is often referred to as a *stack* (as in TCP/IP stack).

The OSI reference model is a hierarchical structure of seven layers that defines the requirements for communications between two computers. The model was defined by the International Organization for Standardization. It was conceived to allow interoperability across the various platforms offered by vendors. The model allows all network elements to operate together, regardless of who built them. By the late 1970's, ISO was recommending the implementation of the OSI model as a networking standard.

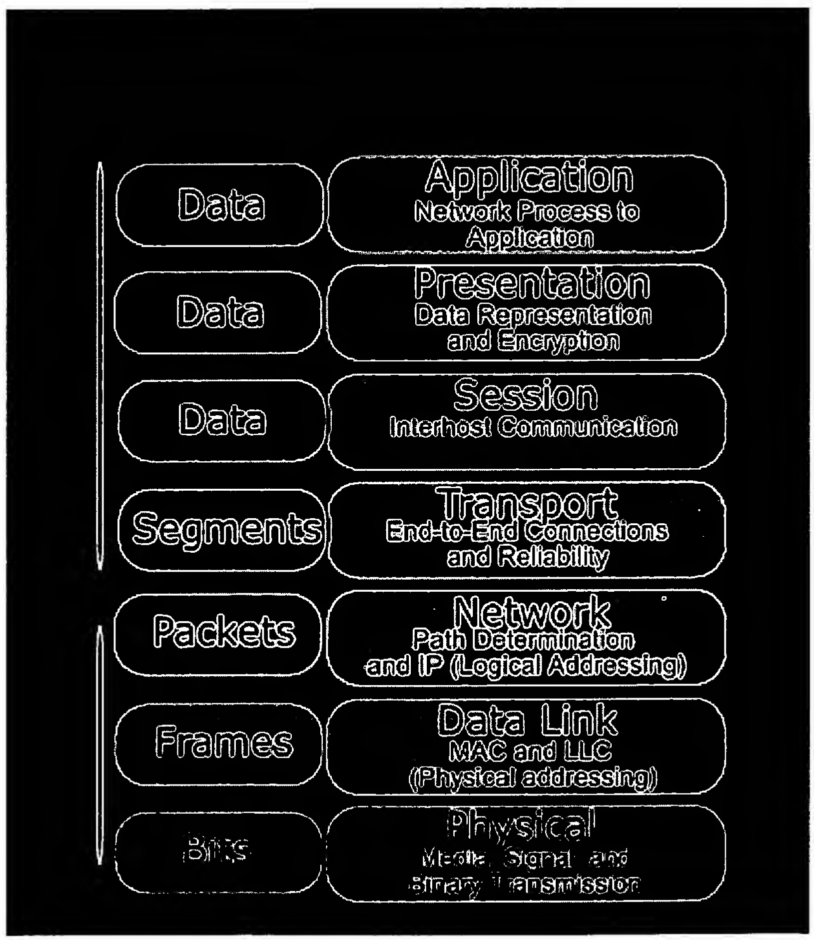
Of course, by that time, TCP/IP had been in use for years. TCP/IP was fundamental to ARPANET and the other networks that evolved into the Internet. (For significant differences between TCP/IP and ARPANET, see RFC 871).

Only a subset of the whole OSI model is used today. It is widely believed that much of the specification is too complicated and its full functionality has taken too long to implement, although there are many people that strongly support the OSI model.

On the other hand, many feel that the best thing about the whole ISO networking effort is that it failed before it could do too much damage......

Description of layers

Layer 1: Physical layer



The physical layer defines all the electrical and physical specifications for devices. This includes the layout of pins, voltages, and cable specifications. Hubs and repeaters are physical-layer devices. The major functions and services performed by the physical layer are:

- establishment and termination of a connection to a communications medium.
- participation in the process whereby the communication resources are effectively shared among multiple users. For example, contention resolution and flow control.
- modulation, or conversion between the representation of digital data in user equipment and the corresponding signals transmitted over a communications channel. These are signals operating over the physical cabling -- copper and fibre optic, for example. SCSI operates at this level.

Layer 2: Data link layer

The data link layer provides the functional and procedural means to transfer data between network entities and to detect and possibly correct errors that may occur in the Physical layer. The addressing scheme is physical which means that the addresses (MAC address) are hard-coded into the network cards at the time of manufacture. The addressing scheme is flat. *Note:* The best known example of this is Ethernet. Other examples of data link protocols are HDLC and ADCCP for point-to-point or packet-switched networks and LLC and Aloha for local area networks.

This is the layer at which bridges and switches operate. Connectivity is provided only among locally attached network nodes.

Layer 3: Network layer

The network layer provides the functional and procedural means of transferring variable length data sequences from a source to a destination via one or more networks while maintaining the quality of service requested by the Transport layer. The Network layer performs network routing, flow control, segmentation/desegmentation, and error control functions. The best known example of a layer 3 protocol is the Internet Protocol. Routers operate at this layer -- sending data throughout the extended network and making the Internet possible (there also exist layer 3 (or IP) switches). This is a logical addressing scheme - values are chosen by the network engineer. The addressing scheme is hierarchical. This layer can be of least significance in case of Broadcasting Networking.

Layer 4: Transport layer

The transport layer provides transparent transfer of data between end users, thus relieving the upper layers from any concern with providing reliable and cost-effective data transfer. The transport layer controls the reliability of a given link. Some protocols are stateful and connection oriented. This means that the transport layer can keep track of the packets and retransmit those that fail. The best known example of a layer 4 protocol is TCP.

Layer 5: Session layer

The session layer provides the mechanism for managing the dialogue between end-user application processes (By dialog we mean that whose turn it is to transmit). It provides for either duplex or half-duplex operation and establishes checkpointing, adjournment, termination, and restart procedures (keeping a track so as to restart from the very same point where they had left in case of a crash). This layer is responsible for setting up and tearing down TCP/IP sessions.

Layer 6: Presentation layer

The presentation layer relieves the Application layer of concern regarding syntactical differences in data representation within the end-user systems. MIME encoding, data compression, encryption, and similar manipulation of the presentation of data is done at this layer. An example of a presentation service would be the conversion of an EBCDIC-coded text file to an ASCII-coded file or serializing objects and other data structures into and out of XML.

Layer 7: Application layer

The application layer interfaces directly to and performs common application services for the application processes. The common application services provide semantic conversion between associated application processes. Examples of common application services include the virtual file, virtual terminal (for example, Telnet), transfer and Manipulation protocol" (JTM, standard ISO/IEC 8832).

Interfaces

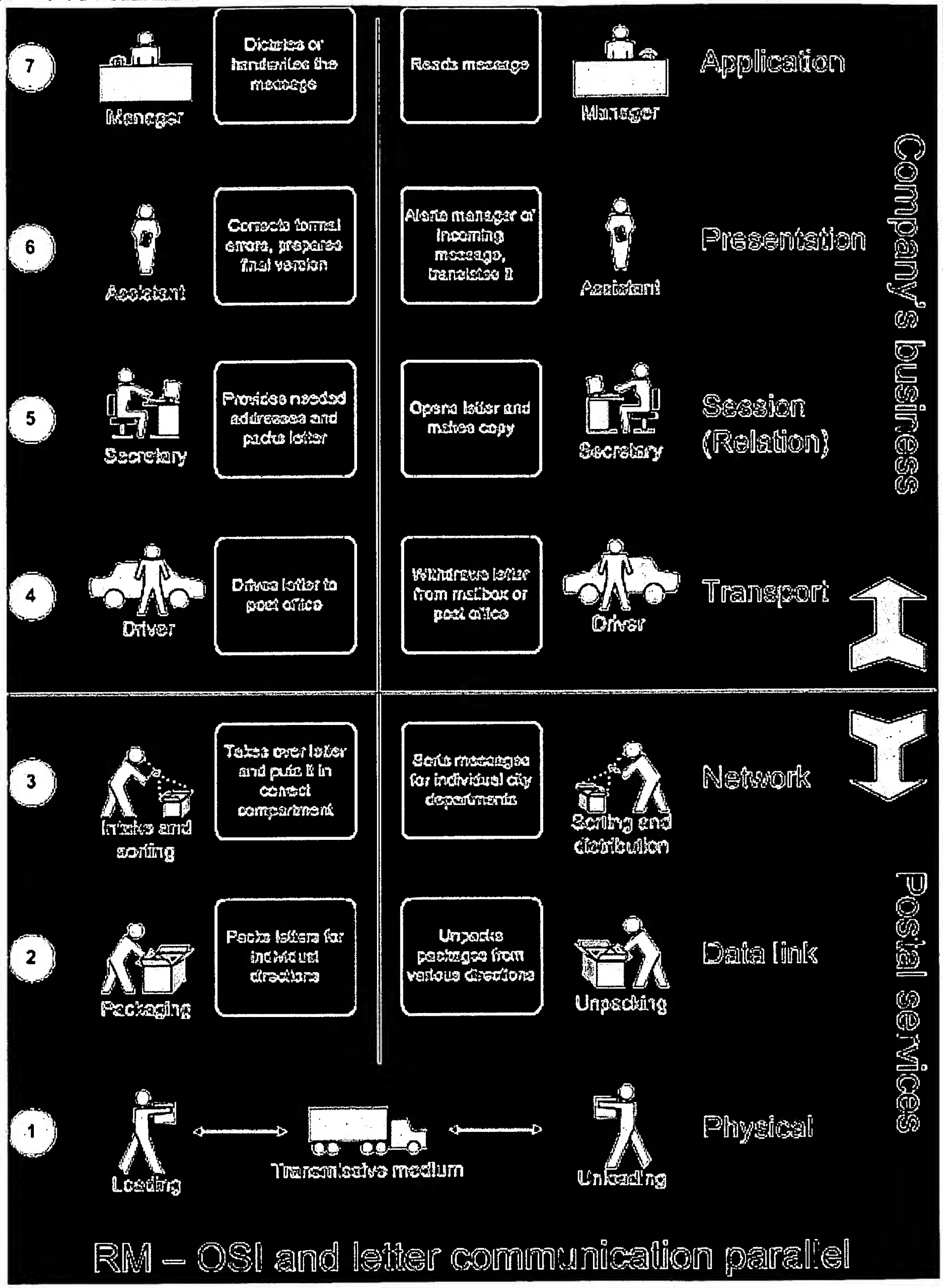
In addition to standards for individual protocols in transmission, there are also interface standards for different layers to talk to the ones above or below (usually operating-system-specific). For example, Microsoft Windows's Winsock and Unix's Berkeley sockets and System V Streams are interfaces between applications (layers 5 and above) and the transport (layer 4). NDIS and ODI are interfaces between the media (layer 2) and the network protocol (layer 3).

Table of examples

Layer	Misc. examples	TCP/IP suite	SS7	AppleTalk suite	OSI suite	IPX suite	SNA	UMTS
7 - Application	HL7, Modbus, SIP	HTTP, SMTP,SMPP SNMP, FTP, Telnet, NFS, NTP	ISUP, INAP, MAP, TUP, TCAP	AFP, PAP	FTAM, X.400, X.500, DAP		APPC	
6 - Presentation	TDI, ASCII, EBCDIC, MIDI, MPEG	XDR, SSL, TLS		AFP, PAP				
5 - Session	Named Pipes, NetBIOS, SAP, SDP	Session establishment for TCP		ASP, ADSP, ZIP		NWLink	DLC?	
4 - Transport	NetBEUI	TCP, UDP, RTP, SCTP		ATP, NBP, AEP, RTMP	TP0, TP1, TP2, TP3, TP4, OSPF	SPX, RIP		
3 - Network	NetBEUI, Q.931	IP, ICMP, IPsec, ARP, RIP, BGP	MTP-3, SCCP	DDP	X.25 (PLP), CLNP	IPX		RRC (Radio Resource Control)
2 - Data Link	Ethernet, Token Ring, FDDI, PPP, HDLC, Q.921, Frame Relay, ATM, Fibre Channel		MTP-2	LocalTalk, TokenTalk, EtherTalk, Apple Remote Access, PPP	X.25 (LAPB), Token Bus	802.3 framing, Ethernet II framing	SDLC	MAC (Media Access Control)
1 - Physical	RS-232, V.35, V.34, Q.911, T1, E1, 10BASE-T, 100BASE-TX, ISDN, SONET, DSL		MTP-1	Localtalk on shielded, Localtalk on unshielded (PhoneNet)	X.25 (X.21bis, EIA/TIA-232, EIA/TIA-449, EIA-530, G.703)		Twinax	PHY (Physical Layer)

Parallel

The picture below is an analogy representing the OSI model in terms of sending and receiving a letter. Read the picture from the top left and go down. When you reach the bottom, shift to the right and go up. ie Follow it as a "U" shape.



This is parallel of OSI and standard letter communication between two company managers.

Humor

The 7 layer model has often been extended in a humorous manner, to refer to non-technical issues or problems. A

common joke is the 9 layer model, with layers 8 and 9 being the "financial" and "political" layers.

Network technicians will sometimes refer euphemistically to "layer-eight problems," meaning problems with an end user and not with the network.

The OSI model has also on occasion been jokingly called the "Taco Bell model", since the restaurant chain has been known for their 7 layer burrito.

Dick Lewis uses an analogy of James Bond delivering classified messages (http://www.lewistech.com/rlewis/Resources/james.aspx) to illustrate the seven-layer model.

See also

- DoD model
- List of network protocols
- OSI protocols

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- This page was last modified 05:59, 12 December 2005.
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OSI protocols

From Wikipedia, the free encyclopedia that anyone can edit.

This is a list of OSI protocols.

There are 7 layers in the OSI protocol system.

Contents

- 1 Physical Layer
- 2 Network Layer
- 3 Transport Layer
- 4 Session Layer
- 5 Presentation Layer
- 6 Application Layer
  - 6.1 Common-Application Service Elements (CASEs)
  - 6.2 Application Processes
- 7 Routing Protocols

Physical Layer

This the physical plugs and sockets and electrical specification of signals

Network Layer

- Connectionless Network Service (CLNS)
- Connectionless Network Protocol (CLNP) (ISO 8473)
- Connection-Oriented Network Protocol (CONP) (ISO 8878)
- Connection-Oriented Network Service (CONS)
- Network Fast Byte Protocol

Transport Layer

- Transport Protocol Class 0 (TP0)
- Transport Protocol Class 1 (TP1)
- Transport Protocol Class 2 (TP2)
- Transport Protocol Class 3 (TP3)
- Transport Protocol Class 4 (TP4)
- Transport Fast Byte Protocol

Session Layer

- Session service - ISO 8306 / X.215
- Connection-oriented Session protocol - ISO 8307 / X.225

- Connectionless Session protocol - ISO 9548

Presentation Layer

- Presentation service - ISO 8822 / X.216
- Connection-oriented Presentation protocol - ISO 8823 / X.2226
- Connectionless Presentation protocol - ISO 9576

Application Layer

Common-Application Service Elements (CASEs)

- Association control service element (ACSE)
- Remote operations service element (ROSE)
- Reliable transfer service element (RTSE)
- Commitment, concurrence, and recovery service elements (CCRSE)
- Security Exchange Service Element (SESE)

Application Processes

- Common management-information protocol (CMIP) X.700
- Directory services (DS) X.500
- File transfer, access, and management (FTAM)
- Message handling system (MHS)
- Virtual terminal protocol (VTP)
- Remote Database Access (RDA)
- Distributed Transaction Processing OSI TP
- Interlibrary Loan Application Protocol ILAP
- DTAM
- Document Printing Application (DPA)
- Document Filing and Retrieval (DFR)

Routing Protocols

- Intermediate System-to-Intermediate System (IS-IS) ISO 10589
- End System-to-Intermediate System (ES-IS) ISO 9542
- Interdomain Routing Protocol (IDRP) ISO 10747

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Category: OSI protocols

List of network protocols

From Wikipedia, the free encyclopedia that anyone can edit.

This is a list of individual network protocols, categorized by their nearest OSI model layers.

Contents

- 1 Layer 1 protocols (Physical layer)
- 2 Layer 2 protocols (Data link layer)
- 3 Layer 2+3 protocols
- 4 Layer 3 protocols (Network layer)
- 5 Layer 3+4 protocols
- 6 Layer 4 protocols (Transport layer)
- 7 Layer 5 protocols (Session layer)
- 8 Layer 7 protocols (Application layer)
- 9 Protocol description languages
- 10 Other protocols
- 11 External links

Layer 1 protocols (Physical layer)

- ISDN Integrated Services Digital Network
- PDH Plesiochronous Digital Hierarchy
  - T-carrier (T1, T3 etc)
- RS-232, a serial line interface originally developed to connect modems and computer terminals
- SDH Synchronous Digital Hierarchy
- SONET Synchronous Optical NETworking

Layer 2 protocols (Data link layer)

- ARP Address Resolution Protocol
- ARCnet
- CDP Cisco Discovery Protocol
- DCAP Data Link Switching Client Access Protocol
- Econet
- Ethernet
- FDDI Fiber Distributed Data Interface
- Frame Relay
- HDLC High Level Data Link Control
- LocalTalk
- L2F Layer 2 Forwarding Protocol
- L2TP Layer 2 Tunneling Protocol
- PPP Point-to-Point Protocol
- PPTP Point-to-Point Tunneling Protocol
- SLIP Serial Line Internet Protocol (obsolete)

- StarLan
- Token ring

Layer 2+3 protocols

- ATM Asynchronous Transfer Mode
- Frame relay, a simplified version of X.25
- MPLS Multi-protocol label switching
- Signalling System 7, also called SS7, C7 and CCIS7; a common PSTN control protocol.
- X.25

Layer 3 protocols (Network layer)

- ARP Address Resolution Protocol
- BGP Border Gateway Protocol
- EGP Exterior Gateway Protocol
- ICMP Internet Control Message Protocol
- IGMP Internet Group Management Protocol
- IP Internet Protocol version 4
- IPv6 Internet Protocol version 6
- MPLS Multiprotocol Label Switching
- OSPF Open Shortest Path First
- RARP Reverse Address Resolution Protocol
- RIP Routing Information Protocol

Layer 3+4 protocols

- Xerox Network Services (XNS)

Layer 4 protocols (Transport layer)

- IL Originally developed as transport layer for 9P
- RTP Real-time Transport Protocol
- SPX Sequenced Packet Exchange
- SCTP Stream Control Transmission Protocol
- TCP Transmission Control Protocol
- UDP User Datagram Protocol

Layer 5 protocols (Session layer)

- 9P Distributed file system protocol developed originally as part of Plan 9
- NCP NetWare Core Protocol
- NFS Network File System
- SMB Server Message Block (aka CIFS Common Internet FileSystem)

Layer 7 protocols (Application layer)

- AFP Apple Filing Protocol

- BACnet Building Automation and Control Network protocol
- BOOTP Bootstrap Protocol
- DIAMETER, an authentication, authorization and accounting protocol
- DICT Dictionary protocol
- DNS Domain Name Service
- DHCP Dynamic Host Configuration Protocol
- FTP File Transfer Protocol
- Finger, which gives user profile information
- Gnutella, a peer-to-peer file-swapping protocol
- Gopher, a precursor of web search engines
- HTTP HyperText Transport Protocol, used in the World Wide Web
- IMAP Internet Message Access Protocol
- IRC Internet Relay Chat Protocol
- Jabber, an instant-messaging protocol
- LDAP Lightweight Directory Access Protocol
- MIME Multipurpose Internet Mail Extensions
- NNTP News Network Transfer Protocol
- NTP Network Time Protocol
- POP3 Post Office Protocol Version 3
- RADIUS, an authentication, authorization and accounting protocol
- Rlogin, a UNIX remote login protocol
- SSH Secure SHell
- SIP, a signaling protocol
- SMTP Simple Mail Transfer Protocol
- SNMP Simple Network Management Protocol
- Telnet, a remote terminal access protocol
- TFTP Trivial File Transfer Protocol, a simple file transfer protocol
- WebDAV Web Distributed Authoring and Versioning

and secure versions of the above (HTTPS, etc.)

Protocol description languages

- Abstract syntax notation one (ASN.1)

Other protocols

- Controller Area Network (CAN)
- Digital Command Control (DCC)
- DSA Distributed Systems Architecture (Honeywell Bull)
- FIX protocol
- I^2C
- modbus
- SNA Systems Network Architecture (IBM)
- SOCKS
- STUN

External links

- Protocol Encapsulation Chart (http://www.wildpackets.com/elements/misc/WP_encapsulation_chart.pdf) - A PDF file illustrating the relationship between common protocols and the OSI Reference Model.
- List of protocols (http://www.networksorcery.com/enp/default0702.htm) – A very expansive list of protocols with examinations on many different types of protocols.
- List of protocols (http://www.protocols.com/) - Another resourceful site with information on many different types of protocols.

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